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PERMANENT ELEMENTS IN EXPERIMENT STATION WORK.*

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Americans have hardly yet grasped the idea of permanency in institutions. For a time, the rapidly rising tide of population was held back by the Alleghanies, and it seemed as if society would assume definite shape in the New World as it had in the Old. Fortunate epoch, for it gave us independence from European control and a Constitution of marvelous strength and flexibility. But when once the barrier of the eastern mountains was passed the surging crest of the tidal wave of emigration swept onward and outward with ever-accelerating rapidity, until the fathermost limits of the great West were reached, when the eddy currents ran hither and thither into the fertile valleys, and even upon the arid highlands. It has been a period of perpetual change and motion, and is not yet closed. Every now and then a President's proclamation removes the artificial dam built across some Indian reservation and the "boomers" flood covers the land in an hour. Under such conditions, how is it possible for individuals or communities to settle down to a calm and steady life or to realize that what they build to-day will not be torn down to-morrow? To "hustle" seems to be the highest virtue, and it is well-nigh impossible to make men see that "haste makes waste." "Act in the living present" is the only motto that seems worth regarding. To plan for the great future requires room and opportunity for quiet thought and patient endeavor, but where can one find either when cities and States are being built in a day? There has been no past. And what, after all, is the future? Magnificent achievements, marvelous development! Yes; but let us try to get our breath in this rarefied atmosphere and consider whether the life of society has any other elements than enterprise and energy. Whether, in fact, the body politic should not have a solid skeleton, as well as swift-coursing blood and highly sensitive nerves. While naturally the most extreme examples of the unrest and shifting of American affairs are found on our most recent frontiers, yet the same spirit is manifested to a large degree even in our oldest communities. How few of our business houses last beyond a single generation! Most of the churches, even in our great cities, are located and constructed without reference to the requirements of the coming centuries. Our schools and colleges too often are living from "hand to mouth," with no apparent realization of the measures necessary to the growth and development of institutions which are to mold the thought and activity of the ages, apparently forgetful of the fact that it is as much the atmosphere of Oxford and Rugby, or even of our own Harvard and Yale, redolent with the wisdom of a long past, which gives form and vigor and the indefinable grace of a true culture to the youthful mind and heart as any prescribed course of training or even the influence of the living teacher. The American loves politics, and may even be said to have a special genius for government, but one might imagine from current newspaper talk that many among us believe that our nation's fate is trembling in the balance all the time and that total destruction may come with any passing strike or Supreme Court decision or Presidential election. We sometimes shout, "The Union forever!" but we go on building post-offices and custom-houses with such hideous architecture and flimsy construction that the stranger landing on our shores is led to inquire how soon the Federal Government expects to give way

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to the autonomy of the States. Even in Washington we have a great pension building which is usually mistaken for a railroad depot, and a Department of Agriculture largely housed in wooden buildings made out of second-hand lumber. It is becoming fashionable to possess what are nowadays called "altruistic tendencies," but I fear that much of our current altruism is confined to efforts to make the world in which we now move more comfortable, to save ourselves the pain of beholding misery and distress ever present before our own eyes. Altruism which takes posterity into account has little place in our midst. We are perfectly willing that as many of us as possible shall enrich ourselves by cutting down the forests. It is none of our concern whether the men of the next century have material for houses or sufficient rainfall for agriculture. And yet there are some promises of a better day. I have lately been deeply impressed with the fact that the young and often thoughtless West has conceived one of those great ideas which permanently affect nations and bless all ages. In the development of great systems of irrigation the arid region has undertaken a task which argues well for the permanency, not only of her agriculture, but of her manifold institutions. These great reservoirs and waterways imply strength and endurance for the States which build them.

It may seem that I have indulged in a lofty preamble to the discussion of a humble theme. But I am convinced that the experiment station enterprise in this country has in it the potency of a vast influence of the greatest of our industries; that it is to be an important permanent feature of our system of institutions for education and research, and that its lines of operation run so close to the life and thought of millions of our fellow-citizens that its development will ever depend on the national appreciation of the proper equipment, operations, and atmosphere of those institutions which are established to promote the advance of civilization and to confer benefits accumulating in number and importance with the lapse of time. The experiment stations of to-day represent the best thought of our generation regarding agriculture, and their defects are largely the reflection of the current mistakes and ignorance of our times regarding the functions of institutions working in the interests of those departments of human life which have had a long past and are to have a long future.

When once we have consciously adopted the idea that the experiment station is to be a permanent institution having distinctive functions, our first effort, perhaps, will be to give it a form of organization which will make it stand out sharply as a distinct entity and at the same time permit it to develop gradually and steadily as its work grows in strength and importance. The station is very properly a department of the college or university, but for that reason it should not be split into as many separate pieces as it has different lines of work, so that we shall have an agricultural section of an experiment station and a horticultural section, and a chemical section, but no solid experiment station. While it may be advisable under certain conditions that the professors of agriculture, horticulture, etc., shall be at the same time members of the station staff they should not be allowed to regard their station work as simply an addendum to the other work of their college departments—to be shifted about as circumstances suggest. The station should be a department of the college as clearly defined as the medical school or the law school; it should have its definite programme of work, and its different lines of effort should be coordinated and systematized so that the public will feel that there is really a permanent agricultural experiment station—an organized effort of science to help the farmer. All this may be effected in such a way as not to interfere with the proper liberty of the individual investigator—indeed, his efforts may be stimulated to greater achievement with the aid of the esprit de corps which connection with an important and well-defined organization greatly promotes. Unity of purpose, aim, and organization will do much to secure the permanence of the experiment station.

Under our system, the control of experiment stations, as of colleges, is committed to boards of management variously constituted, but perhaps most often appointed by the governor of the State. The functions of these boards are, as a rule, loosely defined in the statutes creating them. In a general way, however, it may be said that their proper duties consist in determining the general policy of the station, appointing its chief officers, supervising its expenditures, and standing between the people and the station workers to prevent popular clamor and caprice from interfering with station work and to secure adequate results from the disbursement of public funds. These boards, properly constituted, are composed of eminent citizens who have manifested deep interest in agricultural education and research and who understand the needs and duties of the institutions they are called to supervise. In this country good men for such boards are

usually very busy men. They have neither the time nor the training which fits them to make detailed plans of station work, or to closely supervise the progress of the investigations. When they have carefully selected the proper agents to conduct experimental inquiries in agriculture, with the aid of such expert advice as they can secure, they must be content to wait until results may reasonably be expected before they attempt to sit in judgment on what has been done. It will be perceived that our ideal member of a board of control of an experiment station must be a wise and patient man, and that his functions are of such a delicate nature that experience in the management of such matters ought to make him increasingly valuable to the station and to the community. It is quite essential, therefore, to the permanence and efficiency of the experiment stations that their boards of control shall be stable bodies. The tenure of office should be such that violent and abrupt changes of station policy and work will be out of the question. Wherever political, personal, or other unworthy motives play any considerable part in the selection of members of boards which are to govern experiment stations, there is little hope that sufficient permanence in station work will be maintained to produce the best results. Our people have yet to learn that failure to secure good results from investigations in agriculture rests primarily with the governing boards. They are to be held responsible for the efficient management of these institutions. In their hands lies the destiny of the stations to a greater extent than we have perhaps imagined. It is of the highest importance, therefore, that a righteous tradition regarding the membership and permanence of these boards shall be established in our different communities. That it shall come to be a matter of course, that honest, intelligent, and experienced men shall be kept on these boards, and that the lines of station policy once fixed in right directions shall not be turned aside for trivial or improper reasons.

The idea of permanence should be prominent in the minds of the governing boards when they select the officers of the station. Of course, there will inevitably be more or less shifting about in the subordinate positions, but the responsible officers of the stations must have long tenures if the station work is to be what it ought to be. All the formalities of introduction to office and of continuance therein should be such as to facilitate the choice of able men and to make their positions secure and comfortable. It needs only a superficial survey of our institutions for education and research to discover that in what everybody would consider the best ones there is extraordinary permanence of official tenure. Who expects that a president or professor of Johns Hopkins or Harvard University is to continue in office only for a year or two, or be subject to the cruelty of taking his chances of reelection annually or biennially?

Considerable pains are taken to get good men for these places, and then they are allowed to settle down to work in security and make the most of their opportunities. Of course many men of mediocre ability get into the faculties of even our greatest institutions, but on the whole, that plan which secures the greatest permanency in the personnel of educational and scientific institutions gives the best attainable results. No doubt the American spirit of change often leads the individual workers to voluntarily go from place to place, on insufficient pretexts, to their ultimate disadvantage, as well as to the injury of the institutions they serve. A truly great or useful man is after all not altogether dependent on his surroundings. It may even be better for him to remain in a smaller institution. When the importance of permanent work at experiment stations is more firmly fixed in the minds of both governing boards and station workers, we shall expect to have far fewer changes than at present, to the mutual benefit of the station and the investigator.

Another permanent element of the experiment station is its records. Hitherto this has been much neglected. It rarely occurs that institutions become alive to the desirability of a complete record of their transactions until the time for making such a record is past. I have known several educational institutions which finally awoke in great surprise to find that they had nothing like a complete record of the students who had attended them, or even their graduates—that anything like an adequate history of the institution was out of the question. The accumulation of data which may be of service in the interpretation of nature's laws is one of the important functions of an experiment station. Many facts and phenomena will be observed of no apparent value now which may have great significance after the workers of to-day have passed away. If we really believe we are not working simply for our own day but for all time, we shall carefully record what we do and see, and arrange as far as in us lies to have those records transmitted intact to those who come after us. Time and thought should be given to the form of station records, that they may be orderly, com-

pact, and intelligible, and sufficient clerical assistance should be provided to make them reasonably complete. Of course, such records are the property of the institution and not of the individual, and the authorities should see to it that they are not removed from the custody of the station. There may easily be extravagance in the preparation of unnecessarily elaborate records, but on the other hand what seems to be a saving of a few hundred dollars for a clerk may result in an ultimate loss which can not be calculated in figures. Besides the records of individual experiments there should be certain general records, such as those regarding the station farm, a history of the different fields and plats, the soil, the climate. Some stations in the West are beginning with almost virgin soils. What a grand opportunity to record the changes in the physical and chemical properties of soils due to various known influences. Soil science demands the accurate recording of facts for many years. In this way alone is there any hope of discovering principles or building up a true science of the soil. What is true here is equally true in other lines. I wish simply to emphasize the necessity of more attention to the planning and keeping of station records. I know some of the difficulties, but I believe they may be overcome. I know something of the good work in this line which is being done. I am now presenting the other side.

I suppose that we will all agree that the station records should be more than a series of notebooks. Specimens, photographs, and drawings should illustrate and complete the written records. These should be gathered and arranged on some consistent plan, so as to be far more than a heterogeneous mass of material. Proper provision should be made for the housing of these records. If they can not be kept in fireproof buildings, then at least safes should be provided in which to store them. They should be made and kept under such conditions as will secure them from alteration or destruction.

The printing of these detailed records should not be thought of. Indeed, much that is now put in station bulletins and reports might more wisely be left in the manuscript books in the station safe until enough data have accumulated to make some sort of a satisfactory conclusion possible. Instead of more leave to print, the stations need, perhaps, more compulsion to record and to wait.

As regards the printed matter issued by the stations, I am inclined to think that if the idea of permanency had been more prominent in the minds of the authors there would have been more care in the composition, editing, and typography, and even in the subject-matter. That concise Latin motto, *Scripta manent*—what is writ sticks—should be pinned up in a conspicuous place in the desk of every station writer.

Each station should have a few investigations which it proposes to carry on for a long term of years. In regard to these, what care should be taken in planning, what faithfulness in executing, what accuracy in recording! What a test of the real manhood and greatness of the investigator is presented here! He does not expect to see the end of his labors. What he sows another shall reap. Yet into this work he puts more of wisdom, earnestness, and painstaking than into all his other labors. It is a great and permanent work, therefore it must be done well. It is a cathedral of truth—deserving a great architect, wise master builders, cunning workmen. Each arch and pillar, every beam and architrave, every curve and decoration must be the best that can be made. However out of sight, each part must have its true finish. The reward of the workers is not in having their names blazoned on the portal, but in the thought that their work shall rejoice and bless the coming generations.

I have no fear that we shall fail to embody the permanent elements of experiment station work in suitable form and dress when once we have become possessed of the idea that these are permanent institutions. The needs of the present hour have necessarily occupied most of the attention of our station workers. These needs are pressing still and must be met, but in some way we must find space and opportunity for permanent work. When the station enterprise seemed of doubtful usefulness and likely to continue only a brief time, there was perhaps some excuse for transient effort and irregular, fragmentary records. Now when the usefulness of agricultural investigations is absolutely determined, when no voices are raised to abolish, but all true friends of agriculture seek to uphold and strengthen, the stations, it is hardly less than criminal to let the years slip by without making those arrangements and writing those records which will secure the most lasting benefits to the cause of agricultural advancement. Not in the sand of the desert, but on some rock-hewn pyramid, let us write what may now be only the hieroglyphics of truth. One day the interpreter will come, and we shall be found to have inscribed there a prophetic revelation full of comfort and blessing to our fellow-men.